

## A REVISION OF THE AMERICAN GREAT HORNED OWLS.

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The difficulty of accumulating a satisfactory amount of material has always been a serious obstacle in the study of the great horned owls. The author has been fortunate enough to bring together more than 200 specimens, representing all but one of the American forms, and the opportunity thus afforded for a better understanding of their relationships has, of course, been exceptional.

That the number of subspecies must be considerably increased is hardly surprising, in view of the comparatively small number hitherto recognized and the great geographical area involved. It is evident, however, that there is but one species in all America—North, Central, and South, the various races being intimately connected by individual or geographical intergrades. In contrast to the condition existing in many other similarly plastic types, very few of the New World representatives of *Asio*<sup>a</sup> are confined within closely circumscribed geographical limits. With the exception of *occidentalis* and *vapourouthu*, all seem to be strictly nonmigratory, and thus any record safely may be considered as based upon the resident bird.

Although size seems to be the sole sexual difference, the range of individual variation is very great, further complicating the already difficult problem of relationship. A key to the solution of this problem is furnished by what is probably the most interesting result of the present study—the discovery of the fact that there exists in at least several of the American forms, and probably in not a few of the Old World species as well, a dichromatism, comparable to that of the genus *Otus*,<sup>b</sup> though perhaps not so impressive, which is manifested in a light and a dark, sometimes also a rufous or ochraceous, phase, independent of sex, age, season, or locality: in extreme conditions entirely distinct, yet completely connected by various intermediates.

<sup>a</sup> The proper name of *Bubo*. For explanation of the change see Stone, Auk, XX, 1903, pp. 272-276.

<sup>b</sup> An earlier name for *Pisorbina* (= *Megascops*). See Stone, Auk, XX, 1903, pp. 272-276.

This dichromatism, or rather, polychromatism, together with better knowledge of actual distribution, serve to explain away the supposed interrupted distribution of one or two West American races.

In the present investigation the author has been much aided by the collection of the Biological Survey, by access to the collection of the U. S. National Museum that Mr. Ridgway has accorded, and by the loan of specimens from Mr. William Brewster, Mr. Outram Bangs, Dr. Louis B. Bishop, Mr. Jewell D. Sornborger, and the Academy of Natural Sciences of Philadelphia through Mr. Witmer Stone.

ANALYTICAL KEY TO THE AMERICAN FORMS OF ASIO, BASED ON ADULT FEMALES.

- I. Wing averaging less than 350 mm.
- A. Wing averaging less than 320 mm.
- a.* Exposed culmen less than 40 mm. .... *clachistus*.
- a*<sup>1</sup>. Exposed culmen not less than 40 mm ..... *mayensis*.
- B. Wing averaging more than 320 mm.
- a.* More rufescent throughout ..... *mesembrinus*.
- a*<sup>1</sup>. Less rufescent throughout.
- b.* Upper parts darker ..... *nigrescens*.
- b*<sup>1</sup>. Upper parts lighter.
- c.* More finely barred below; bill smaller. .... *magellanicus*.
- c*<sup>1</sup>. More coarsely barred below; bill larger ..... *melanercus*.
- II. Wing averaging more than 350 mm.
- A. Wing averaging over 370 mm.
- a.* Light colored.
- b.* Very pale; feet immaculate ..... *rapacanthu*.
- b*<sup>1</sup>. Darker; feet more or less spotted.
- c.* Darker above; lower parts more heavily barred. .... *algitus*.
- c*<sup>1</sup>. Lighter above; lower parts less heavily barred ..... *occidentalis*.
- a*<sup>1</sup>. Dark colored.
- b.* Face and notæum more blackish, less rufescent.
- c.* Lower parts paler; feet less mottled. .... *heterocnemis*.
- c*<sup>1</sup>. Lower parts darker; feet more heavily mottled. .... *saturatus*.
- b*<sup>1</sup>. Face and notæum lighter, more rufescent ..... *lagophonus*.
- B. Wing averaging under 370 mm.
- a.* Upper parts lighter.
- b.* Face and lower parts lighter; feet less spotted ..... *pallescens*.
- b*<sup>1</sup>. Face and lower parts darker; feet more spotted. .... *pacificus*.
- a*<sup>1</sup>. Upper parts darker.
- b.* Wing averaging over 360 mm.; very rufescent ..... *virginianus*.
- b*<sup>1</sup>. Wing averaging under 360 mm.; less rufescent.
- c.* More blackish above; feet scarcely mottled. .... *nigrescens*.
- c*<sup>1</sup>. Less blackish above; feet much mottled. .... *icelus*.

ASIO MAGELLANICUS MAGELLANICUS (Gmelin).

*Strix lubo* *δ. magellanicus* GMELIN, Syst. Nat., I, 1788, p. 286.

*Strix macrurus* VIEILLÖT, Nouv. Dict. d'Hist. Nat., VII, 1817, p. 44.

*Type locality*.—Southern South America.

*Geographical distribution*.—Southern South America, north to Peru and Southern Brazil.

*Measurements (4 males).*—Wing, 312-327 (average, 320.3) mm.; tail, 183-200 (average, 191) mm.; exposed culmen, 35-37 (average, 36) mm.; culmen without cere, 25-26 (average, 25.8) mm.—(1 female).—Wing, 342 mm.; tail, 204 mm.; exposed culmen, 37 mm.; culmen without cere, 25 mm.

This race is very closely allied to those from Mexico and the southwestern United States, averaging different from *pacificus* only in reduced size and narrower character of the dark barring on the lower surface; from *melancerus* in smaller bill, paler upper parts, and less heavily barred ventral surface.

Gmelin described both *magellanicus* and *virginianus* on the same page,<sup>a</sup> but as all the American forms of the genus seem to be conspecific, the name *magellanicus*, as it stands first, must be used for the species.

Specimens have been examined from the following localities:

*Chile.*—Gregory Bay, Straits of Magellan; Santiago.

*Argentine Republic.*—Upper Rio Chico, Patagonia.

#### ASIO MAGELLANICUS NIGRESCENS (Berlepsch).

*Bubo nigrescens* BERLEPSCH, Proc. Zool. Soc. Lond., 1884, p. 309.

*Chars. subsp.*—Similar to *Asio magellanicus magellanicus*, but with more blackish and less rufous both above and below.

*Type locality.*—Cechee (10,000 feet), western Ecuador.

*Geographical distribution.*—Ecuador.

*Measurements (of type, a female).*—Wing, 350 mm.; tail, 185 mm.; culmen, 30.5 mm.; tarsus, 80 mm.

Although not examined in the present connection, this form is apparently quite distinct, differing from *virginianus* and the other similar races in its deep blackish appearance and its notable reduction or lack of fulvous tints.

#### ASIO MAGELLANICUS MESEMBRINUS, new subspecies.

*Chars. subsp.*—Resembling *Asio magellanicus magellanicus*, but very much more rufescent throughout, and with a larger bill.

*Type locality.*—San José, Costa Rica.

*Geographical distribution.*—Costa Rica.

*Measurements (of type).*—Wing, 340 mm.; tail, 198 mm.; exposed culmen, 41 mm.; culmen without cere, 29 mm.; tarsus, 63 mm.; middle toe, 39 mm.

*Description.*—Type, [female] adult, No. 33218, U.S.N.M.; San José, Costa Rica; J. Carmiol. Above brownish black, much mottled and vermiculated with whitish and buffy, these markings least conspicuous on the head; the cervix, upper back, and rump with much

<sup>a</sup>Syst. Nat., 1, 1788, p. 286.

tawny; all the feathers of the upper parts with the subbasal portions tawny, the exterior webs of scapulars also of this color; wing-coverts like the back, but with more whitish; wing-quills fuscous, with broad, broken, buffy bars on the outer webs, and bars of ochraceous buff on the inner vanes, these markings becoming distally more obsolete and brownish; tail fuscous, the middle feathers very irregularly barred and mottled with buffy and whitish, the rest vermiculated and more regularly barred with buffy and ochraceous; forehead and supraloral region mixed white, buffy, ochraceous, and dark brown; facial disk tawny, mixed with whitish and blackish, bounded behind by a black bar which is almost continuous with the black and tawny "horns;" chin and throat white, between them a band of dark brown and tawny feathers; chest deep tawny with vermiculations and large spots of blackish, mixed with some white; rest of lower parts deep tawny, with some admixture of white medially, and thickly barred with dark brown; lining of wing white and tawny, barred and spotted with blackish; tibiae tawny, slightly spotted posteriorly with dusky; feet and tarsi dull buff, almost unmarked.

This form is much more different from all of its nearest geographic relatives than it is from *Asio m. virginianus*, with which it closely agrees in color, though much inferior in size.

**ASIO MAGELLANICUS MELANCERUS**, new subspecies.

*Chars. subsp.*—Similar to *Asio magellanicus mesembrinus*, but rufescent colors paler and less extensive both above and below, particularly on abdomen, thighs, and feet, the last more spotted; face somewhat lighter.

*Type locality.*—Tehuantepec City, Oaxaca, Mexico.

*Geographical distribution.*—Guatemala, and Mexico north to Jalisco, Guanajuato, and southern Tamaulipas.

*Measurements (1 male).*—Wing, 320 mm.; tail, 180 mm.; exposed culmen, 36 mm.; culmen without cere, 26. (*3 females.*)—Wing, 345–355 (average, 349) mm.; tail, 205–210 (average, 207.3) mm.; exposed culmen, 39–41 (average, 40) mm.; culmen without cere, 27–29 (average, 28) mm.

*Description.*—Type, adult female, No. 59497, U.S.N.M.; Tehuantepec City, Oaxaca, Mexico, October 16, 1869; F. Sumichrast. Upper surface brownish black, mottled and vermiculated with white, buffy, and deep ochraceous, this marking least extensive on the head; wing-coverts like the back; wing-quills fuscous, with wide broken bars, exteriorly of whitish or light brownish, interiorly of ochraceous or ochraceous buff; tail fuscous, broadly barred with whitish and ochraceous, most irregularly on the middle feathers; forehead and supraloral region brownish black, mottled with white and buffy; facial disk grayish, mixed with ochraceous and blackish, bounded behind by a

black bar; horns brownish black, the inner and basal parts ochraceous; sides of neck mingled white, dark brown, and ochraceous; chin and throat white, separated by a band of dark brown and ochraceous; breast ochraceous, mottled with whitish and dark brown, and heavily spotted with brownish black; rest of lower parts, with lining of wing, white, more or less mixed with ochraceous, and barred with dark brown; the ochraceous legs and dull buffy feet barred and spotted with dusky.

This race more closely resembles *pacificus* than it does either *pallescens* or *mayensis*, both of which in geographical position are nearer. It may be distinguished from *pacificus* by its smaller size, larger bill, darker upper parts, and the usually greater amount of rufescent admixture in the plumage of the face.

The type of this race is a specimen in rufous (or better, ochraceous) plumage, but not less common is a gray phase, differing in the restriction and pallor of the rufescent parts of the plumage, though the general effect of the whole bird is just as dark.

Specimens examined come from the following localities:

*Oaxaca*.—Tehuantepec.

*Guanajuato*.—Guanajuato.

*Jalisco*.—Guadalajara; Etzatlan; La Barca.

*Puebla*.—Orizaba; Chalehicomula.

*Michoacan*.—Querendaro; Zamora.

*Mexico*.—Mount Popocatepetl; Talpam.

*Tamaulipas*.—Soto La Marina.

*Guatemala*.—[No further locality given.]

#### ASIO MAGELLANICUS MAYENSIS (Nelson).

*Bubo virginianus mayensis* NELSON, Proc. Biol. Soc. Washington, XIV, 1901, p. 170.

*Chars. subsp.*—Resembling *Asio magellanicus melanocerus*, but paler; the lower parts not so heavily barred, and with less rufous; face and feet less rufescent, the latter less conspicuously mottled with dusky.

*Type locality*.—Chichen Itza, Yucatan, Mexico.

*Geographical distribution*.—Yucatan, Mexico.

*Measurements (of type, a female)*.—Wing, 315 mm.; tail, 198 mm.; exposed culmen, 41 mm.; culmen without cere, 29 mm.; tarsus, 54 mm.; middle toe, 45 mm.

This form was described by Mr. Nelson from a single specimen, and none but the type has been available for present comparison. The validity of the race, however, seems to be sufficiently attested by the characters above detailed. It approaches apparently most closely to *pallescens* and *pacificus*; differing from the latter in smaller size, larger bill, usually more grayish face, and slightly paler lower surface.

## ASIO MAGELLANICUS PALLESCENS (Stone).

*Bubo virginianus pallescens* STONE, Amer. Nat., XXXI, 1897, p. 237 (in text).

*Chars. subsp.*—Like *Asio magellanicus mayensis*, but larger, with relatively smaller bill; upper surface paler.

*Type locality.*—Watson Ranch, Medina River, 18 miles southwest of San Antonio, Texas.

*Geographical distribution.*—Western Texas to southeastern California; south to northern Mexico.

*Measurements (9 males).*—Wing, 330–360 (average, 341) mm.; tail, 195–225 (average, 215.9) mm.; exposed culmen, 33–39 (average, 37.3) mm.; culmen without cere, 24–29.5 (average, 27.3) mm. (*9 females.*)—Wing, 355–375 (average, 362.8) mm.; tail, 200–235 (average, 222) mm.; exposed culmen, 35–43 (average, 39) mm.; culmen without cere, 26–31 (average, 29) mm.

The present subspecies, by reason of its much smaller size and much paler colors throughout, is so very different from *virginianus* that for typical specimens no comparison is necessary. It seems to reach its greatest degree of pallor in Arizona and the immediately contiguous region. A specimen from Rodriguez, Nuevo Leon, Mexico, somewhat approaches *virginianus*, though not strongly enough to warrant its reference to that form.

In *Asio m. pallescens* there is, in almost any locality, a remarkably wide range of variation, irrespective of altitude or other influences sometimes supposed to be potent in producing such differences in this group of birds; for, in fine, this race exhibits to a marked degree the dichromatism existing in many of the others. The ordinary or light phase in its extreme manifestation is almost as white below as *Asio m. wapacuthu*, with legs and feet as immaculate, and is sometimes even paler above, though of course on account of small size not to be confused with that form. The dark phase is of very different appearance, the color above being very blackish, the lower parts dark, with markings blackish instead of brownish, the feet ochraceous and much mottled, thus to some degree resembling the similar condition of both *occidentalis* and *wapacuthu*, yet rather more ochraceous. There is also a third phase which comes close to the light phase of *virginianus*, and in which ochraceous predominates throughout the plumage of both upper and lower parts, including the face and feet. The type of *pallescens* is intermediate between the ochraceous and the light gray phases.

Specimens examined are from the following localities:

*Arizona.*—Tucson; Colorado River at Monument 204, Mexican Boundary Line; San Bernardino Ranch; Fort Lowell; Camp 98, Kennerly and Möllhausen; Fullers; Oracle; Fort Whipple; Huachuca Mountains; Phoenix.

*New Mexico.*—San Luis Mountains; Chico Springs; Longitude 107° 15', Mexican Boundary Line.

*Texas.*—Fort Clark; Marathon; Medina; Presidio County; Watson Ranch, 18 miles southwest of San Antonio; Monahans.

*Lower California.*—Salton River (United States Boundary Line); Gardiners Lagoon (United States Boundary Line).

*Nuevo Leon.*—Rodriguez.

*Coahuila.*—Sabinas.

**ASIO MAGELLANICUS PACIFICUS (Cassin).**

*Bubo virginianus* variety *pacificus* CASSIN, Illustr. Birds Calif., Texas, etc., 1854, p. 178.

*Chars. subsp.*—Similar to *Asio magellanicus pallescens*, but darker throughout; feet much more heavily mottled with dusky; face with usually more admixture of rufous.

*Type locality.*—Western North America (southern California<sup>a</sup>).

*Geographical distribution.*—California, except the southeastern part and the northern and central coast districts; extending northward to Fort Klamath, Oregon, eastward to the San Francisco Mountains, Arizona.

*Measurements (6 males).*—Wing, 313–353 (average 336.5) mm.; tail, 190–218 (average, 204.5) mm.; exposed culmen, 34–38 (average, 36) mm.; culmen without cere, 25–27 (average, 26) mm. (*4 females.*)—Wing, 350–370 (average, 360.7) mm.; tail, 213–228 (average, 219.3) mm.; exposed culmen, 34–38 (average 36.8) mm.; culmen without cere, 27–28 (average, 27.5) mm.

A specimen from Fort Klamath, Oregon, doubtless referable here, is very ochraceous, and suggests the existence of another phase in this race. A single bird from San Bernardino, California, is quite as small as *alchistus*, but probably is abnormally so, as specimens from farther south are much larger. None of *pacificus* from Lower California have been examined, though the present subspecies undoubtedly occupies at least the extreme northern portion. The reference of the birds from the region of the Grand Canyon of the Colorado, Arizona, to *pacificus* is not wholly satisfactory, though the only specimens we have seen—one from the San Francisco Mountains and another from the Coconino Plateau, Arizona—appear to be nearest this form. The first-mentioned example is decidedly larger than any of our specimens of *pacificus*, besides being rather dark, and, after all, this and the one from the Coconino Plateau may be nothing more than dark-phase intermediates between *pallescens* and *occidentalis*.

Specimens from the following localities have been seen:

*California.*—Dulzura; San Diego; Fort Tejon; Fullerton; San Bernardino; Fort Crook; Kern Lakes; Red Bluff.

*Arizona.*—San Francisco Mountain; Coconino Plateau, Grand Canyon of the Colorado.

*Oregon.*—Fort Klamath.

<sup>a</sup> Stone, Auk, XIII, 1896, p. 155.

## ASIO MAGELLANICUS ELACHISTUS (Brewster).

*Bubo virginianus elachistus* BREWSTER, Bull. Mus. Comp. Zool., XLI, 1902, p. 96.

*Chars. subsp.*.—Similar to *Asio magellanicus pacificus*, but very much smaller.

*Type locality.*.—Sierra de la Laguna, Lower California.

*Geographical distribution.*.—Southern Lower California.

*Measurements (5 males).*.—Wing, 305–325 (average, 315.6) mm.; tail, 175–206 (average, 190.3) mm.; exposed culmen, 33–38 (average, 36.5) mm.; culmen without cere, 21–26 (average, 24.8) mm. (*1 female*).—Wing, 330 mm.; tail, 211 mm.; exposed culmen, 38 mm.; culmen without cere, 27.5 mm.

*Description (light phase).*.—Adult male, No. 17238, U.S.N.M.; Caduana, Lower California, November 25, 1859; John Xantus. Upper surface dull brown, so much mixed and mottled with white, grayish, buff, and pale ochraceous that the general appearance is quite light; wing-coverts and exposed surface of innermost secondaries like the back, with, however, somewhat more white; rest of wing-quills fuscous, with broad bars of buffy and ochraceous distally growing obsolete; tail-feathers fuscous, the middle pair and outer webs of all but outermost brokenly barred with whitish or buff. The remainder broadly barred with ochraceous buff; extreme forehead and supraloral line white; facial disk ochraceous, slightly mixed with dusky, and bordered posteriorly by a black band; ear tufts deep brown, the inner webs and basal portion of the feathers chiefly ochraceous buff; sides of neck mixed white, buff, and dark brown; chin and throat white, divided by a band of ochraceous mixed with dark brown; breast pale ochraceous mingled with white, spotted and vermiculated with blackish; rest of lower surface white, somewhat mixed with pale ochraceous posteriorly, and barred with dark brown except on median portion of abdomen; lining of wing white, spotted with ochraceous and dark brown; tibiae ochraceous buff, indistinctly marked with dusky; feet and tarsi dull white, the latter posteriorly a little spotted with dusky.

This race may be distinguished from *Asio m. melancervus* by its reduced size, paler and less rufescent coloration. Compared with *mayensis*, it has a smaller bill, and more ochraceous or rufous in the plumage, particularly that of the face.

In *elachistus* there are two very distinct phases, one light, the other dark. Mr. Brewster's type is an example of the latter, which seems to be the more common, and from which the former so much differs as to be deemed worthy of the above description.

Examples from the following localities have been examined:

*Lower California.*.—La Paz; Caduana; San José del Rancho; Sierra de la Laguna; Santa Anita.



## ASIO MAGELLANICUS ICELUS, new subspecies.

*Chars. subsp.*.—Resembling *Asio magellanicus pacificus*, but very much darker, particularly on the upper parts.

*Type locality.*.—San Luis Obispo, California.

*Geographical distribution.*.—Coast of California, north of about 35 north latitude.

*Measurements (1 male).*.—Wing, 335 mm.; tail, 215 mm. (*2 females.*).—Wing, 345–360 (average, 352.5) mm.; tail, 203–230 (average, 216.5) mm.; exposed culmen, 38–40 (average, 39) mm.; culmen without cere, 27.5–28.5 (average, 28) mm.

*Description.*.—Type, adult female, No. 141225, U.S.N.M.: Biological Survey Collection; San Luis Obispo, California, November 29, 1891; E. W. Nelson. Upper surface brownish black, mottled and irregularly barred with buffy ochraceous and grayish white, least so on the forehead and horns; tail fuscous, with broad broken bars of ochraceous, which, on the middle feathers, become almost white; wings fuscous, both the quills and their coverts barred on exterior webs with dull, mottled grayish, brownish or whitish, on the inner webs with pale ochraceous; face mixed grayish, ochraceous, and blackish; chin and sides of neck generally similar to the upper surface; throat white; breast buffy, with spots and irregular bars of black; rest of lower surface buffy whitish, heavily barred with black, except in middle of abdomen, where these markings are brown and less conspicuous; feet and tarsi pale buff, or whitish, much mottled with dark brown; under wing-coverts white or buffy, with heavy irregular bars and other markings of dark brown and blackish.

The affinities of this new form are with the *saturatus* group, as to reasonable extent might be expected from its range, rather than with *pacificus*. An example from Redwood City, California, is somewhat darker and more rufescent than those from the localities more southern, indicating an intergradation to the northward with either *lagophonus* or *saturatus*.

Our specimens are from the subjoined localities:

*California.*.—San Luis Obispo; Redwood City; Nicasio.

## ASIO MAGELLANICUS LAGOPHONUS, new subspecies.

*Chars. subsp.*.—Resembling *Asio magellanicus icelus*, but larger; the feet darker; all the ochraceous and rufous tints, particularly on face and feet, much more pronounced.

*Type locality.*.—Fort Walla Walla, Washington.

*Geographical distribution.*.—Washington and northern Oregon (excepting the coast region), with Idaho; north through eastern and central British Columbia to Cook Inlet and the interior of Alaska.

*Measurements (9 males).*—Wing, 345–370 (average, 355.8) mm.; tail, 210–235 (average, 223.5) mm.; exposed culmen, 35–41 (average, 37.9) mm.; culmen without cere, 25–30 (average, 27.4) mm. (*6 females*).—Wing, 350–400 (average, 375.8) mm.; tail, 213–252 (average, 238.5) mm.; exposed culmen, 36–42.5 (average, 40.1) mm.; culmen without cere, 26–31 (average, 29.2) mm.

*Description.*—Type, adult male, No. 88377, U.S.N.M.; Fort Walla Walla, Washington, November 13, 1881; Capt. Charles Bendire. Upper surface brownish black, much mottled and vermiculated with whitish, buffy, and ochraceous, the last most conspicuous anteriorly, but the subbasal portions of all the feathers more or less ochraceous; wing-coverts like the back; wing-quills fuscous, barred broadly though somewhat irregularly on outer webs with dull buffy or brownish white, on interior webs with ochraceous; tail sepia, barred brokenly and vermiculated with whitish, buff, and ochraceous, the last predominating; forehead and supraloral line grayish white, mixed with ochraceous and brownish; facial disk ochraceous, somewhat mixed with blackish, and bounded behind by a black band; horns blackish, with considerable ochraceous on inner webs and basal portions; sides of neck mixed dark brown, whitish, and ochraceous; chin and throat white, divided by a collarette of dark brown, ochraceous-margined feathers; remainder of lower surface white and ochraceous, heavily, and in places confluent, barred with brownish black, the breast also blotched with the same; lining of wing white and ochraceous, barred and spotted with blackish; legs and feet ochraceous, barred and spotted with dark brown.

This subspecies differs from *pacificus* in its larger size; darker upper and lower parts, the latter more heavily barred; more strongly mottled legs and feet; darker and more rufescent facial disk. It is apparently most closely allied to *saturatus* and *icelus*, but is quite easily distinguishable from either.

The specimen from Pengra, Oregon, here referred, is decidedly intermediate between *lagophonus* and *occidentalis*. Birds from Cook Inlet and the interior of Alaska are in color apparently identical with those from Idaho and Washington, though one from Fort Yukon is almost dark enough for *saturatus*. These birds from Alaska are, however, somewhat larger than typical *lagophonus*, and their inclusion in the measurements above given to some extent accounts for the wide range of variation.

Although there is much individual color difference among examples of this race, yet, in so far as is shown by our material, there is little or no indication of a pale phase.

. Specimens from the following localities have been examined:

*Washington.*—Walla Walla; Cascade Mountains; 25 miles southeast of Toledo.

*Oregon.*—Douglas County; Des Chutes River; Pengra.

*Idaho.*—Sawtooth Lake.

*British Columbia.*—Vernon.

*Alaska.*—Nulato; Fort Yukon; Hope, Cook Inlet; Knik, Cook Inlet; Kowak River.

**ASIO MAGELLANICUS SATURATUS** (Ridgway).

*Bubo virginianus saturatus* RIDGWAY, Explor. and Surv. 40th Par., IV, 1877, p. 572, footnote.

*Chars. subsp.*—Similar to *Asio magellanicus lagophomus*, but darker, particularly above; face and rest of plumage with less ochraceous and rufous, producing on the upper surface a more uniform appearance; feet much darker and more heavily mottled.

*Type locality.*—Simiahmoo, Washington.

*Geographical distribution.*—Pacific coast region, from Washington (and probably at least northern Oregon) north to southern Alaska.

*Measurements (♂ males).*—Wing, 345–358 (average, 348.3) mm.; tail, 205–222 (average, 212.3) mm.; exposed culmen, 39–41 (average, 39.8) mm.; culmen without cere, 28.5–29 (average, 28.9) mm. (*6 females*).—Wing, 360–383 (average, 374.7) mm.; tail, 215–242 (average, 227.2) mm.; exposed culmen, 38–42 (average, 40) mm.; culmen without cere, 28–31 (average, 30) mm.

With the possible exception of *nigrescens*, this race is more deeply colored than any of its American congeners, the legs and feet being particularly dark and heavily mottled. So far as we have been able to determine, there is no light phase. A single example from Ashcroft, British Columbia, is intermediate between *saturatus* and *lagophomus*; and another from Sitka, Alaska, verges also somewhat toward the latter form.

Specimens examined come from the following localities:

*Washington.*—Fort Steilacoom; Skagit County; Similkameen; Port Townsend; American Lake; Simiahmoo.

*British Columbia.*—Kamloops; Lund; Ashcroft.

*Alaska.*—Sitka.

**ASIO MAGELLANICUS HETEROCNEMIS**, new subspecies.

*Chars. subsp.*—Like *Asio magellanicus saturatus*, but bill larger; posterior lower parts paler; feet lighter colored and less heavily spotted; upper parts with usually less ochraceous.

*Type locality.*—Lance au Loup, Labrador.

*Geographical distribution.*—Labrador, including at least the north coast of the Territory of Ungava.

*Measurements (2 males).*—Wing, 350–365 (average, 357.5) mm.; tail, 220–230 (average, 225) mm.; exposed culmen, 41 mm.; culmen without cere, 30 mm. (*7 females*).—Wing, 370–390 (average, 380) mm.; tail,

225-250 (average, 239) mm.; exposed culmen, 38-44 (average, 41.3) mm.; culmen without cere, 28-32 (average, 30.1) mm.

*Description*.—Type, adult male, No. 4445, collection of E. A. and O. Bangs; Lance au Loup, Labrador, April 9, 1899; Ernest Doane. Above brownish black, vermiculated and mottled with whitish, least so on the head; wing-coverts like the back, though with rather more white; wing-quills fuscous, the outer webs with broken bars of whitish or buffy, the inner with partial bars of ochraceous buff on the basal portion; tail sepia brown, the middle feathers with mottlings and broken bars of whitish and buffy, the rest with irregular bars of paler brown and ochraceous; forehead and supraloral streak white, much mixed with brown; facial disk dull gray, with mixture of blackish and some ochraceous, bordered behind by a black band which joins the black horns; sides of the neck mottled with dark brown, whitish, and ochraceous; chin and throat white, separated by a dark brown band whose feathers have grayish or ochraceous edgings; breast ochraceous, with blotches, bars, and mottlings of brown and white; remainder of lower surface barred with black and white, with laterally much ochraceous and buffy; lining of wing mottled with white, brown, and ochraceous; tarsi and tibiae deep ochraceous, spotted and irregularly barred with dusky; feet dull buffy grayish, spotted and obsoletely barred with dark brown.

Although by authors heretofore referred to *saturatus*, the Labrador bird differs from that form as detailed above, and its characters, though not as strongly marked as are those of some of the other races, are yet sufficient for recognition by name, particularly in view of a widely separated range. Although, of course, nearest *saturatus*, the differences may be readily appreciated in a good series. For the privilege of describing this form the writer is indebted to the courtesy of Mr. Outram Bangs, who had already noted its distinctness.

Specimens from the following localities have been seen:

*Labrador*.—Okkak; Makkovik; Hopedale; Turnavik Island; Lance au Loup; Fort Nascopie.

*Ungava*.—Fort Chimo; Near Forks.

#### ASIO MAGELLANICUS VIRGINIANUS (Gmelin).

*Strix virginiana* GMELIN, Syst. Nat., I, 1788, p. 287.

*Strix bubo* variété *E. ludovicianus* DAUDIN, Traité d'Orn., II, 1800, p. 210.

*Bubo pinicola* VIEILLOT, Hist. Nat. Ois. Am. Sept., I, 1807, p. 51, pl. XIX.

*Strix crassirostris* VIEILLOT, Nouv. Dict. d'Hist. Nat., VII, 1817, p. 44.

*Strix macrorhyncha* TEMMINCK, Pl. Color., II, 1821, pl. 62.

*Bubo virginianus* variété *atlanticus* CASSIN, Illustr. Birds California, Texas, etc., 1854, p. 178.

*Chars. subsp.*—Similar to *Asio magellanicus heterocnemis*, but much smaller; very much more rufous throughout; legs and feet less conspicuously mottled.

*Type locality*.—Virginia.

*Geographical distribution.*—Southern Canada and eastern United States, west to Ontario, Wisconsin, Iowa, and eastern Texas; accidental in Ireland.<sup>a</sup>

*Measurements (7 males).*—Wing, 320–355 (average, 343.3) mm.; tail, 190–210 (average, 199.4) mm.; exposed culmen, 38–40 (average, 39.4) mm.; culmen without cere, 26–30 (average, 28.6) mm. (*6 females*).—Wing, 352–380 (average, 366.3) mm.; tail, 200–225 (average, 218) mm.; exposed culmen, 38–43 (average, 40.7) mm.; culmen without cere, 29–32.5 (average, 30.6) mm.

In normal phase this race is characterized by a deep rufescence throughout, very different from the other subspecies living north of Mexico. There are, however, two other phases of *virginianus*—one in which the coloration is light, and the place of rufous tints is taken by ochraceous; the other in which grayish and blackish colors predominate; all three phases being connected by intermediates. The last seems to be most prevalent in the New England States, and possibly indicates vergence toward *heteroenemis*.

A careful comparison proves that birds from Florida do not differ at all, either in size or color, from those of the Middle Atlantic States. Some specimens from the region of the Lower Rio Grande are rather light-colored, but neither in this respect nor in any other can they be distinguished from examples of the light phase commonly occurring in the Eastern States; while a specimen taken at Rockport, Texas, is typical of *virginianus* in dark rufous plumage. The breeding bird of Iowa is undoubtedly *virginianus*, though *occidentalis* occurs in winter. We have seen no summer birds from Minnesota, but at least the southern part of this State is probably inhabited by the present race.

Specimens from the subjoined localities have been examined:

*Arkansas.*—Fayetteville.

*District of Columbia.*—

*Florida.*—Sebastian; Fort Bassinger; Orange Hammock; Lake Kissimmee.

*Illinois.*—Sugar Creek Prairie; Mount Carmel.

*Indiana.*—Upperville; Toleston.

*Indian Territory.*—[No further locality given.]

*Iowa.*—Mitchell County.

*Maryland.*—Rockville; Laurel; Sandy Spring; Cornfield Harbor.

*Michigan.*—Saginaw County.

*Missouri.*—Marble Cave.

*New Jersey.*—[No further locality given.]

*Ohio.*—Madisonville; Wooster.

*Pennsylvania.*—Carlisle.

*Texas.*—Rockport; Brownsville.

*Virginia.*—Ammondale; Glymont; Amelia.

<sup>a</sup>Belle Lake, county Waterford, January 27, 1851; see Zoologist, 1881, p. 308.

## ASIO MAGELLANICUS ALGISTUS, new subspecies.

*Chars. subsp.*—Similar to *Asio magellanicus lagophonus*, but much paler throughout; the lower parts less heavily barred; the legs and feet not so conspicuously mottled.

*Type locality.*—Saint Michael, Alaska.

*Geographical distribution.*—Northwest coast region of Alaska.

*Measurements (2 males).*—Wing, 355–360 (average, 357.5) mm.; tail, 225–245 (average, 235) mm.; exposed culmen, 41 mm.; culmen without cere, 29 mm. (*4 females*).—Wing, 355–390 (average, 371.5) mm.; tail, 225–240 (average, 232) mm.; exposed culmen, 39–43 (average, 41) mm.; culmen without cere, 28–31 (average, 29.3) mm.

*Description.*—Type, [male] adult, No. 70276, U.S.N.M.; St. Michael, Alaska; L. M. Turner.—Upper parts brownish black, with numerous mottlings and irregular bars and spots of white, most of the feathers extensively ochraceous basally; tail dark brown, the middle feathers and outer webs of all but the outermost vermiculated, and irregularly and broadly barred with white or buffy white, this replaced by ochraceous on the rest of the tail; wing-coverts like the back; wing-quills dark brown, broadly barred irregularly with buff and ochraceous; horns brownish black, mottled with ochraceous and whitish; forehead and supraloral stripe white; facial disk grayish, mixed to some extent with ochraceous, and bordered behind by a black band; sides of neck mottled brown, white, and ochraceous; chin and throat white, separated by a band of blackish feathers with ochraceous and buffy edgings; breast white with some ochraceous buff, blotched, irregularly barred, and mottled with blackish brown; abdomen and crissum white, with more or less regular bars of dark brown; sides much mixed with ochraceous; lining of wing white, with markings of dark brown and ochraceous; tarsi and tibiae ochraceous buff, with broken bars of brownish; feet buffy white, obscurely spotted with dusky.

This subspecies of *Asio magellanicus* really much more resembles *occidentalis* or *pacificus* than it does its nearest geographic relative, *lagophonus*; but is not identical with either. From *occidentalis* it may be separated by its darker upper surface, particularly the wings, and by its somewhat less heavily barred lower surface; while from *pacificus* its larger size, less ochraceous face, and the paler ochraceous of the upper surface will serve for differentiation.

It is possible that I err in referring to *lagophonus* the Alaskan specimens of *Asio* from the timbered region, for it may be that these large birds are but the dark phase of *algistus*, yet in so far as the material now available shows, save in one single instance, the difference in plumage is correlated with change of area, the lighter birds being confined in a general way to the Barren Grounds.

Examples from the following localities are referred to this form:

*Alaska.*—St. Michael; Kowak River; Lower Yukon River; Port Huron; Aleknagik River.

## ASIO MAGELLANICUS OCCIDENTALIS (Stone).

*Bubo virginianus occidentalis* STONE, Auk, XIII, 1896, p. 155.

*Chars. subsp.*—Like *Asio magellanicus pallescens*, but considerably larger; colors averaging darker.

*Type locality.*—Mitchell County, Iowa (winter).

*Geographical distribution.*—Western United States, from Minnesota and Kansas to Nevada, southeastern Oregon, Utah, and Montana; south in winter to Iowa.

*Measurements (10 males).*—Wing, 333–365 (average, 349.6) mm.; tail, 200–225 (average, 212.8) mm.; exposed culmen, 35–40 (average, 37.6) mm.; culmen without cere, 26–28 (average, 27.1) mm. (9 females.)—Wing, 360–390 (average, 376.1) mm.; tail, 220–240 (average, 230.5) mm.; exposed culmen, 37–43 (average, 40.7) mm.; culmen without cere, 28–33 (average, 30.2) mm.

Although hitherto not recognized, this form is a fairly well-marked one, and covering, as it does, an extensive area, is well worthy a name. Colorado and Nevada specimens are somewhat darker than those from Montana and the Dakotas. In Colorado, and doubtless in other localities also, *occidentalis* has a dark phase, characterized by great increase of blackish both above and below.

Specimens of this race examined come from the following places:

*Colorado.*—Elk Mountains: Routt County; Pueblo County; Twin Lakes; Cache la Poudre River.

*Iowa.*—Mitchell County; Grinnell.

*Kansas.*—Pendennis.

*Montana.*—St. Marys Lake; Fort Custer; Fort Shaw.

*Minnesota.*—Aitkin; Elk River; Excelsior.

*Nevada.*—Austin (35 miles southwest).

*North Dakota.*—Missouri River, 87 miles below Fort Union; Devils Lake.

*Oregon.*—Prineville.

*Wyoming.*—Fort Bridger; Deer Creek; West Fork of Medicine Bow Creek.

## ASIO MAGELLANICUS WAPACUTHU (Gmelin).

*Strix wapacuthu* GMELIN, Syst. Nat., I, 1788, p. 291.

*Bubo arcticus* SWAINSON, Faun. Bor.-Amer., II, 1832, p. 86, pl. xxx.

*Bubo subarcticus* HOY, Proc. Acad. Nat. Sci. Phila., VI, 1852, p. 211.

*Chars. subsp.*—Similar to *Asio magellanicus occidentalis*, but paler, the upper parts with lighter ochraceous, less black, and more white, the lower surface more whitish, less heavily barred, the feet with less mottling and less ochraceous—usually immaculate.

*Type locality.*—Hudson Bay, Canada.

*Geographical distribution.*—Northern Canada, from Hudson Bay to the Valley of the Mackenzie River; south in winter to the northern United States, from Idaho to Wisconsin.

*Measurements (5 males).*—Wing, 337–368 (average, 352) mm.; tail, 215–230 (average, 221.6) mm.; exposed culmen, 37–42 (average, 39.5) mm.; culmen without cere, 27–30 (average 28.5) mm. (*2 females.*)—Wing, 385–390 (average, 387.5) mm.; tail, 235–237 (average, 236) mm.; exposed culmen, 43 mm.; culmen without cere, 31–31.5 (average, 31.3) mm.

This is the palest of all the American members of the genus *Asio*, the general whiteness being usually very conspicuous. From *Asio m. albigatus* it differs as from *occidentalis*, though in greater measure. In dark phase it is most like the normal or light condition of *occidentalis*, but the dark markings are deeper and more contrasted, the feet usually white with little or no ochraceous or dark mottling.

The southward limit of the breeding range it is impossible at present to delineate with even approximate exactness, as proper material from the interior of British America is not available. Specimens that have been examined, however, point to the probability that *wapacuthu* summers at least as far south as Saskatchewan.

Dr. Richmond has shown<sup>a</sup> that the name *arcticus* of Swainson, so long in use for this race, is preoccupied and consequently untenable. As a substitute he proposes to revive *subarcticus* of Hoy, which has been commonly applied to the pale forms of the western United States. There seems to be, however, a prior name in *Strix wapacuthu* Gmelin,<sup>b</sup> which by nearly all authors has been synonymized with *arcticus*. This name is based on the "Wapacuthu Owl" of Pennant,<sup>c</sup> and its accompanying description is an excellent one of the arctic horned owl, with the exception of the statement that the bird is without ears, a mistake that might easily occur, particularly with an imperfect specimen. Furthermore, that it is not *Nyctea nyctea*, the only other owl to which the name could by any possibility apply, is clearly evidenced by the diagnosis, added to which is the statement that the young are white.

Specimens of this form from the following localities have been examined, probable breeding records being indicated by an asterisk:

*Mackenzie.*—Fort Resolution\*; Slave River, 75 miles below Fort Smith.\*

*Saskatchewan.*—Moose Lake\*; Pas\*.

*Ontario.*—Moose Factory; Michipicoten Island, Lake Superior.

*Minnesota.*—Aitkin.

*North Dakota.*—Devils Lake.

*Wisconsin.*—Racine.

<sup>a</sup>Proc. Biol. Soc. Wash., XV, 1902, p. 86.

<sup>b</sup>Syst. Nat., I, 1788, p. 291.

<sup>c</sup>Arct. Zool., II, 1785, p. 231.